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Facets Of Mindfulness As Predictors Of Resistance To Alcohol-Related Disorders

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Facets of Mindfulness as Predictors of Resistance to Alcohol-Related Disorders

BY

Jacob Landers

THESIS

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Running Head: Facets of Mindfulness as Predictors of Resistance to Alcohol-Related Disorders

Facets of Mindfulness as Predictors of Resistance to Alcohol-Related Disorders

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Abstract

Mindfulness is defined as a state of mind, a tendency and willingness to 'bring one's complete attention to the experiences occurring in the present moment in a nonjudgmental and accepting way' (Brown & Ryan, 2003). The concept originated from the Eastern spiritual traditions and has recently made its way to the West. Although mindfulness-based practices have met with success in alleviating a wide range of problematic conditions such as depression, anxiety, and addiction, it is still unclear as to which specific dimensions of mindfulness are responsible for the positive effects. Baer, Smith, Hopkins, Krietemeyer, and Toney (2006) extracted five facets of mindfulness from currently existing measures of mindfulness. They are: 'acting with awareness', 'nonreactivity to inner experience', 'nonjudging of inner experience', 'describing', and 'observing'. The purpose of this study was to determine which of these five facets best predict resistance to alcohol-related disorders. One hundred five Eastern Illinois University college students responded to the Five Factor Mindfulness Questionnaire as well as the Index of Alcohol Involvement and the Alcohol Use Disorder Identification Test which measured the extent to which one is involved in alcohol abuse and dependency. Given the two measures of alcohol abuse/dependence, two multiple regression analyses were conducted with the five facets of mindfulness as potential predictors. Only three of the five facets were statistically significant, that of 'observing', 'acting with awareness', and 'nonreactivity to inner experience', but not 'nonjudging of inner experience' and 'describing.' However, 'nonreactivity to inner experience' did not account for the most variance as anticipated; rather, 'acting with awareness' proved to be the most consistent predictor by appearing in both multiple regression models. Implications of these findings

on theory and the treatment of alcohol abuse/dependence were discussed.

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Introduction

The purpose of this study was to determine which facets of mindfulness predict the extent to which a person is free from or is resistant to alcohol-related disorders. Determining which specific facets of mindfulness are predictive of resistance to alcohol abuse or dependency will help therapists and researchers identify what possible mechanisms or pathways mindfulness may take in preventing or changing addictive behaviors. Likewise, it will aid treatment providers who are particularly interested in using mindfulness as a form of intervention in setting targets and refining their therapeutic programs.

Mindfulness is a state of mind, a tendency and willingness to "bring one's complete attention to the experiences occurring in the present moment, in a nonjudgmental or accepting way" (Brown & Ryan, 2003; Kabat-Zinn, 1990; Linehan, 1993; Marlatt & Kristeller, 1999, as cited in Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006, p. 27). The concept of mindfulness, originating from the Eastern spiritual traditions of Buddhism and Hinduism, has recently made its way to the West. As interest in the concept has grown, some therapists have developed interventions in which mindfulness serves as the foundation, while others have incorporated specific concepts or practices of mindfulness. Mindfulness interventions such as Mindfulness-Based Stress Reduction, Mindfulness-Based Cognitive Therapy, Acceptance and Commitment Therapy, and Dialectical Behavior Therapy have shown promise in working with a wide range of symptomatic behavior and cognitions.

The Origins and Various Facets of Mindfulness

Approximately 2,500 years ago prince Siddhartha attained enlightenment after discovering "how the mind and body create their own suffering" (Olendzki, 2005, p. 252). After attaining enlightenment Siddhartha was referred to as Buddha, and he began introducing a set of mental activities that attempted to prolong an uninterrupted state of awareness to others. In the Pali language Buddha spoke, the term for this mindful investigation is "vipassana". "Vipassana" is more commonly referred to in the Western clinical setting as mindfulness, which Bennett-Goleman (2001) defines as "seeing things as they really are, without trying to change them" (p. 6). Bishop and colleagues (2004) reported that "mindfulness approaches are not considered relaxation or mood management techniques, however, but are a form of mental training to reduce cognitive vulnerability to reactive modes of mind that might otherwise heighten stress and emotional distress or that may otherwise perpetuate psychopathology" (p. 231). Many texts describe the difficulty of understanding mindfulness is not borne out of its complexity, but from its simplicity.

Cultivating mindfulness. As we engage in mindfulness, we begin to see our internal and external world more clearly. Bennett-Goleman (2001) stated that "some alchemical schools liken our ordinary state of mind to a lump of coal and compare clear awareness to a diamond" (p. 6). Our lives can be seen as parallel to coal, clouded and disillusioned until a process comes along which leads to a metamorphosis. Similar to how coal has the ability to be transformed into a diamond, given the proper conditions, so too can our minds be transformed, provided we have the proper tools. An examination of mindfulness provides us with numerous techniques which we can draw from to cultivate this prolonged state of awareness.

Bennett-Goleman (2001) describes one way of cultivating mindfulness is through "Mindfulness of the Breath", which entails focusing our attention upon our breath while simultaneously refraining from changing the experience. During this practice our breath acts as an anchor, harboring our attention in the here-and-now. By simply focusing our attention on any aspect of breathing, whether it is the sensation of inhaling and exhaling or the movement of one's abdomen while breathing, we begin to redirect the focus of our attention. If the mind happens to wander, we acknowledge the cognition/emotion/experience and simply bring our attention back to our breath. Through such practice, we avoid becoming entwined in distorted cognitions/emotions/experiences. We begin to live in the here-and-now, experiencing life as it unfolds, rather than focusing on the what-ifs of the past and future.

Another practice of mindfulness is "Mindfulness of Eating" (Bennett-Goleman, 2001). During this practice one can choose any type of food, though often times a raisin is used for this exercise. At the start, the meditator is instructed to let go of preconceived notions regarding the exercise/raisin. Throughout the exercise we purposefully shift our attention to the different aspects of eating. First, we hold the raisin within our palm and finger tips, paying close attention to the texture and feel of the raisin. As we bring the raisin to our lips we shift our attention again, noticing the sensations of muscles in our arms and the feel of the raisin on our lips. Shifting our attention again we notice the flavor of the raisin as we chew, and finally the sensation of swallowing as the raisin travels down our esophagus. Often we find ourselves eating while engaged in other activities, our attention is no longer focused upon the experience, rather it is focused upon socializing or some other activity. Here we see the benefits as two-fold. When we allow ourselves to place

our full attention on the activity of eating we can improve the quality of the experience. Likewise, as we notice when we are satiated, we ultimately consume less.

Benefits of being mindful. In the book *Mindfulness and Psychotherapy,* Olendzki discussed the view of the human condition in Buddhism and Hinduism. Olendzki (2005) stated:

> "…the ancient Buddhist and Hindu schools of thoughts shared the view that human existence centers upon a node of conscious awareness, more or less identified as a soul, which is embedded in a sensory apparatus yielding both pleasant and painful experience. The nature of this existence is flawed by the fact that pain is inevitable, lasting pleasure is unobtainable, and humans have limited ability to see themselves or their world very clearly" (p. 242).

It is this attempt to avoid painful experiences and to hold on to pleasurable ones which constitutes unnecessary suffering in our life. The cultivation of mindfulness acts as a catalyst for the development of other equally important concepts such as equanimity. Bennett-Goldman (2001) stated that "cultivating this quality of mindful attention allows us to go through our days with the ability to notice any thoughts or feelings, no matter how initially disturbing, and be relatively unperturbed" (p. 35). Buddhist psychology describes seven "factors of awakening", which aid in the development of a prolonged state of awareness (Morgan & Morgan, 2005). These seven factors are 'partial attention', 'investigation', 'energy', 'joy', 'tranquility', 'concentration', and 'equanimity'. Morgan and Morgan (2005) reported that mindfulness, or 'partial attention', serves as the foundation for the development of the other six "factors of awakening". Equanimity, one of the remaining six factors, is described as "the attention rudder that keeps mindfulness

smooth and steady" rather than allowing the mind to "steer toward that which is interesting, and turning away from, or holding at arm's length, that which is less appealing" (Morgan & Morgan, 2005, p. 78). Equanimity, rising from the cultivation of mindfulness, frees us from unnecessary suffering in our daily lives and leads to a fuller, richer experience.

Divergent traditions of mindfulness. Mindfulness is studied and practiced in two divergent traditions, the Eastern spiritual paths of Buddhism and Hinduism and the Western secular clinical setting. Even though the two traditions share a common goal of alleviating suffering, their focus of interest lies in different areas. Overall, "Buddhist doctrines are bounded by and are a reflection of the Eastern culture where nonlinear, present reality thinking is highly valued", in contrast to the Western culture's "future focus, linear thinking" (Dudley-Grant, 2003, p. 106). While the Eastern tradition works on the internal, or "self", Western secular areas have focused on the external, human behavior, and the benefits which may be reaped through mindfulness practice. According to Goldstein (2002) and Kabat-Zinn (2000), within the Eastern spiritual tradition, "mindfulness can be developed through the regular practice of meditation, and that increases in positive qualities such as awareness, insight, wisdom, compassion, and equanimity are likely the result (as cited in Baer et al., 2006, p. 27). On the other hand, in the Western tradition, mindfulness is conceptualized as a set of skills. Development of these skills leads to a reduction in cognitive and affective symptoms and an increase in health and well-being.

Operationalizing mindfulness. John Kabat-Zinn, a leading researcher of mindfulness in the Western clinical setting, defined mindfulness as: "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally

to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). The capacity to attend to both our external and internal world is an innate ability, simply requiring us to pay attention. As with any other ability, however, through practice we can retrain our mind to a more sustained form of attention, reaping the physiological and psychological benefits.

Due to the increased interest surrounding mindfulness, there have been numerous attempts to define and measure the concept for research purposes. Some researchers have taken a multi-faceted approach to mindfulness by specifying its various features or dimensions (e.g., Baer, Smith, & Allen, 2004; Baer et al., 2006). For example, Baer and colleagues (2004) developed the Kentucky Inventory of Mindfulness Skills (KIMS). The KIMS measures four separate facets of mindfulness, that of 'observing', 'describing', 'acting with awareness', and 'accepting without judgment'. Baer and colleagues (2006) reported alpha coefficients for the four facets ranged from .76 to .91, which support the four factor solution. On the other hand, other researchers view mindfulness as a single unitary concept (e.g., Brown & Ryan, 2003). Brown and Ryan (2003) developed the Mindful Attention Awareness Scale (MAAS) around a single unitary concept. They were interested in assessing levels of attention and awareness rather than tapping other factors associated with the concept of mindfulness. Still, other researchers have attempted to capture a multi-faceted approach, though the researchers suggest interpreting scores unidimensionally (e.g., Chadwick, Hember, Mead, Lilley, & Dagnan, 2005; Feldman, Hayes, Kumar, & Greeson, 2004; Buchheld, Grossman, & Walach, 2001). For example, the Frieburg Mindfulness Inventory (FMI), developed by Buchheld and colleagues (2001), attempts to measure four facets of mindfulness, that of 'present-moment disidentifying

attention', 'nonjudgemental, nonevaluative attitude toward self and others', 'openness to negative mind states', and process-oriented, insightful understanding'. Even though the researchers attempt to measure four facets Baer and colleagues (2006) reported that "the solution was somewhat unstable from preretreat to postretreat and many items loaded on more than one factor" (p. 29). For this reason the authors suggest interpreting the FMI unidimensionally.

In an attempt to uncover the underlying structure of mindfulness, Baer and colleagues (2006) asked 613 undergraduate students to complete five existing self-report measures of mindfulness. They included: a) the Mindful Attention Awareness Scale (MAAS), which measures a general tendency to be attentive to and aware of present-moment experience in daily life (p. 28); b) the Freiburg Mindfulness Inventory (FMI), assessing nonjudgmental present-moment observation and openness to negative experience (p. 29); c) the Kentucky Inventory of Mindfulness Skills (KIMS), designed to measure four facets of mindfulness; d) the Cognitive and Affective Mindfulness Scale (CAMS), measuring attention, awareness, present-focus, and acceptance/nonjudgment with respect to thoughts and feelings in general daily experience (p. 29), and; e) the Mindfulness Questionnaire (MQ), assessing a mindful approach to distressing thoughts and images (p. 29) (Baer et al., 2006). Although the FMI, CAMS, and the MQ attempt to measure separate facets of mindfulness, the authors suggest interpreting the questionnaires unidimensionally. The only multidimensional measure, the KIMS, provides scores for each of the four facets of 'observing', 'describing', 'acting with awareness', and 'accepting without judgment'.

The students' responses to the five measures of mindfulness (a total of 112 items) were then analyzed for correlations to identify the underlying facets or dimensions of mindfulness. Five facets were extracted: (1) 'nonreactivity to inner experience', (2) 'observing', (3) 'acting with awareness', (4) 'describing', and (5) 'nonjudging of inner experience'. After excluding those items which loaded on more than one facet, the researchers constructed a mindfulness scale comprised of 64 items that tapped into these five facets. This new scale is called the Five Facet Mindfulness Questionnaire.

Various facets of mindfulness. The first facet, 'nonreact', refers to "nonreactivity to inner experience" (Baer et al., 2006, p. 34). Individuals who score high on this facet are less likely to react impulsively when experiencing distressing affective states. Negative reactions would include maladaptive behaviors in response to our emotions, such as lashing out physically or verbally when angered. Examples of items measuring the first facet include; "I perceive my feelings and emotions without having to react to them" and "In difficult situations, I can pause without immediately reacting" (Baer et al., 2006, p. 34).

The second facet, 'observing', is described as "noticing/attending to sensations/perceptions/thoughts/feelings" (Baer et al., 2006, p. 34). Individuals scoring high on the 'observing' facet would refrain from holding on to or avoiding experiences/emotions which they deem to be pleasant or unpleasant. For instance, an individual experiencing worry due to public speaking would notice their emotions without avoiding giving their speech. Conversely, those experiencing moments of happiness would not attempt to prolong those states. Items used to measure the 'observing' facet include; "When I'm walking, I deliberately notice the sensations of my body moving." and "I pay attention to how my emotions affect my thoughts and behavior" (Baer et al., 2006, p.

34).

The third facet, 'acting with awareness', includes "acting with awareness/ (not on) automatic pilot, concentration/nondistraction" (Siegel, 2007, p. 12). By 'acting with awareness' careless behavior would be avoided, such as locking keys in a car or leaving behind needed materials at work. Items included to measure the third facet are; "I find it difficult to stay focused on what's happening in the present" and "I do jobs or tasks automatically, without being aware of what I'm doing" (Baer et al., 2006, p. 34).

The fourth facet, 'describing', refers to "labeling into words" (Baer et al., 2006, p. 35). Through 'describing' one does not find difficulty in expressing one's own thoughts or feelings. For example, individuals scoring high on this facet would not find difficulty verbally expressing why they feel depressed or anxious. Items used to measure the fourth facet include; "I can usually describe how I feel at the moment in considerable detail" and "I'm good at finding the words to describe my feelings" (Baer et al., 2006, p. 35).

The fifth facet, 'nonjudge', refers to "nonjudging of inner experience" (Baer et al., 2006, p. 35). By 'nonjudging' one does not berate oneself for having thoughts or emotions which they deem to be inappropriate such as criticizing oneself for being shy or being fearful in particular situations. Items used to measure the facet 'nonjudging of inner experience' include; "I tell myself I shouldn't be thinking the way I'm thinking" and "I make judgments about whether my thoughts are good or bad" (Baer et al., 2006, p. 35).

Mindfulness in the Clinical Setting

The Eastern spiritual tradition as well as the Western secular setting have developed their own techniques for cultivating mindfulness. In the Theravada tradition there are different schools of "vipassana" or "insight meditation". These traditions exist

in Burma, Cambodia, Thailand, and Sri Lanka. Within these schools, meditators learn the importance of the concept of impermanence. Marlatt and colleagues (2004) reported that "vipassana meditation seeks to teach the practitioner how to transcend physical and mental events and to reach a direct, perceptual experience of events as impermanent (anicca)" (p. 267). The meditator comes to an understanding of how experiences, such as pain and pleasure, are an inevitable part of life which cannot be avoided or held on to. One's suffering stems from an attempt to hold onto or avoid the inevitable. Through "vipassana" the meditator learns the concept of impermanence, or the transient state of all experiences. For example, one cannot avoid the pain experienced upon accidentally stubbing one's toe. The mindful individual would be aware of and accepting of the pain, and would not create unnecessary suffering by saying things such as, "I am stupid" or "I cannot do anything right".

In the Western clinical setting we see various forms of therapies developed around the teachings of mindfulness, or utilizing concepts of mindfulness, each with its own particular goal. The most common include Mindfulness-Based Stress Reduction (MBSR), Mindfulness-Based Cognitive Therapy (MBCT), Acceptance-Commitment Therapy (ACT), and Dialectical Behavior Therapy (DBT).

Mindfulness-Based Stress Reduction (MBSR). John Kabat-Zinn developed MBSR, formerly known as the Stress Reduction and Relaxation Clinic, at the University of Massachusetts in the 1970's. MBSR aids in the alleviation of unnecessary suffering among those experiencing chronic pain and associated emotional turmoil. Set in an eight-week group format, participants meet weekly for approximately two to three hours. Outside of the group, participants practice mindfulness skills for 45 minutes, six days a

week. Unlike other forms of meditation, participants are taught to recognize cognitions and/or emotions as they arise, nonjudgmentally, rather than viewing the cognition/emotion as a distracter to be guarded against. Linehan (1993, p.87) stated that "an important consequence of mindfulness practice is the realization that most sensations, thoughts, and emotions fluctuate, or are transient, passing by "like waves in the sea" (as cited in Baer, in press, p. 3). As participants progress through MBSR they bring the cultivated awareness to day-to-day activities, reducing the tendency to respond automatically to experiences. Because MBSR is centered on the teaching of mindfulness, we see all five facets identified by Baer and colleagues being cultivated within a participant, that of 'nonjudging of inner experience', 'nonreactivity to inner experience', 'observing', 'describing', and 'acting with awareness'. Patients suffering from chronic pain, and other psychological/physiological stressors, have benefited from the MBSR program.

Because of the high financial cost of health care, Reibel, Greeson, Brainard, and Rosenzweig (2001) were interested in examining the effects of MBSR on health-related quality of life as well as on the physical and psychological symptoms in a heterogeneous patient population (p. 183). For a period of two years, between 1997 and 1999, the researchers offered 12 separate MBSR courses. Each course lasted for eight weeks, and met weekly for 2.5 hours. Outside of the programs participants were requested to formally meditate for 20 minutes, six days per week. Three health-related questionnaires were utilized to assess the physical and mental health status of participants, including the Medical Outcomes Study Short-Form Health Survey (SF-36), Symptom Checklist-90 Revised (SCL-90-R), and Medical Symptom Checklist (MSCL), and were administered pre- and post-treatment. Their results indicated "significantly enhanced health-related

quality of life, reduced physical symptoms, and decreased psychological distress" (Reibel et al., 2001, p. 189). In addition, following a one-year follow up, participants reported improvements in several areas, including "vitality, self-reported medical symptoms, over-all psychological distress, anxiety, and depression" (Reibel et al., 2001, p. 190).

In another study, Shapiro, Brown, and Biegel (2007) studied the effectiveness of Mindfulness-Based Stress Reduction for those training to become therapists. The authors address the host of negative consequences mental health professionals are susceptible to, including anxiety, depression and reduced self-esteem, while caring for those who are experiencing psychological turmoil. Participants were recruited from a master's level counseling psychology program at a Jesuit university. A total of 83 students participated, 22 in the intervention course and 61 students in the two control courses. Each course met for a total of 10-weeks, three-hours per week. Upon the third week the eight-week MBSR intervention was introduced. Modeled after the program developed by John Kabat-Zinn and colleagues, participants received training in five mindfulness practices, including sitting meditation, the body scan, Hatha yoga, guided loving kindness meditation, and "informal practices which emphasized brining mindfulness into day-to-day life" (Shapiro et al., 2007, p. 108). Pre- and post-course measures included the Mindful Attention Awareness Scale, the Positive and Negative Affectivity Schedule, the Perceived Stress Scale, the State/Trait Anxiety Inventory, and a portion of the Reflection Rumination Questionnaire. The researchers' results were in line with their predictions. Shapiro and colleagues (2007) reported that "compared to cohort controls, students in the MBSR program reported significant pre- post-course declines in perceived stress, negative affect, state and trait anxiety, and rumination, and significant increases in positive affect and

self-compassion" (p. 111).

Mindfulness-Based Cognitive Therapy (MBCT). MBCT is an eight-week program based upon the fundamental concepts of mindfulness and cognitive therapy, and was based on the MBSR program. MBCT's goal is to utilize core mindfulness concepts in conjunction with cognitive therapy as a way to prevent future relapses of depression. The core skill that the MBCT program inculcates the ability, at times of potential relapse, to recognize and disengage from mind states characterized by self-perpetuating patterns of ruminative, negative thought (Segal, Williams, & Teasdale, 2002, p. 75). The concern, if individuals are unable to disengage from the negative mindsets, is that they will be more likely to reenter a depressive episode. The general idea is a shift in the individual's concept of mode from "doing" to "being".

Segal and colleagues (2002) reported the "doing" mode is "entered when the mind registers discrepancies between an idea of how things are (or how they are expected to become) and an idea of how things are wished to be, or of how things ought to be" (p. 70). When this mode is entered negative feelings arise and individuals attempt to achieve their desired state through previously self-defeating habitual patterns. Here, the individual is constantly reevaluating their situation, ruminating on the past and future, without experiencing the here-and-now. Overall, individuals are not "getting anywhere" with this form of cognition. Whereas the "doing" mode is goal-oriented the "being" mode is not concerned with achieving any particular goal. Segal and colleagues discussed the difficulty of verbally describing the "being" mode, and that it is best understood when experienced directly. In other words, as clients begin practicing mindfulness they will better understand what it means to be mindful. The focus of the "being" mode is

"accepting" and "allowing" what is, without any immediate pressure to change it (Segal et al., 2002, p. 73). It is here we see mindfulness aiding the individual to transition from one mindset to another.

In the description of "Mindfulness as a Core Skill" three of the facets of mindfulness identified by Baer and colleagues are cultivated: that of 'acting with awareness', 'observing', 'nonreactivity to inner experience', but not 'describing'. Awareness of the patterns of thoughts, feelings, and bodily sensations that characterize relapse-related mind states (and the doing mode of mind more generally) is an essential first step in recognizing the need for corrective action (Segal et al., 2002, p. 77). For this reason, awareness is the focus of sessions one through four in MBCT. During the first four sessions clients learn how often we allow our minds to wander, moving through life on automatic pilot. Once aware, clients begin to learn how to bring their attention back to the here-and-now. Finally, the connection is made between allowing our minds to wander and the rise of negative cognitions and affective states. These goals are attained through several exercises, such as "Body Scan" and "Mindfulness of the Breath". Sessions five through eight focus on when to handle shifts in mood. The sessions parallel the facets of 'observing', 'nonreactivity to inner experience', and 'describing'. With their newly found awareness, the clients are then taught in session five to 'observe' internal experiences, such as cognitions, affect, and/or sensations, and "describe" these experiences in their own words. For example, an individual who is anxious would learn to notice the sensations and verbalize their experience, such as "I am worried about tomorrow's job interview". Additionally, Segal and colleagues discuss the importance of breathing space, which provides an opportunity for individuals to decide how to respond to a cognition/emotion,

rather than reacting impulsively. Results of MBCT research show promise in preventing relapse of depressive episodes.

Kingston, Dooley, Bates, Lawlor, and Malone (2007) assessed the efficacy of MBCT in a psychiatric outpatient population with a history of recurrent major depressive disorder and residual depressive symptoms (p. 194). In addition, the researchers were interested in the effect mindfulness would have on levels of rumination. Their study consisted of two groups; the first group participated in MBCT, consisting of eight participants, while the second group, consisting of 11 participants, participated in treatment as usual (TAU), involving outpatient treatment and pharmacotherapy. After the MBCT group completed the program, the TAU group was then administered the MBCT program, serving as a delayed wait list control. Those who participated met the criteria for ≥ 3 previous episodes of major depressive disorder, residual symptoms of depression, and a score of between 13 and 45 on the Beck Depression Inventory (BDI). Measures utilized included the BDI, to assess depressive symptoms, and the Rumination Scale, to assess ruminating, pre-and post-treatment. The researchers found a decrease in residual depressive symptoms during the MBCT program, and maintenance of these gains at a one-month follow-up. In addition, levels of rumination decreased in both groups.

Acceptance and Commitment Therapy (ACT). Unlike MBSR and MBCT, which are rooted within the mindfulness concept, "ACT does not describe its treatment methods in terms of mindfulness or meditation" (Baer, in press, p. 5) but incorporates strategies that are consistent with the various mindfulness approaches. ACT originated from behavior analysis, more specifically contextualism, and relational frame theory. Through the lens of contextualism "psychological events are conceptualized as a set of ongoing interactions

between whole organisms and historically and situationally defined contexts" (Hayes, 2004, p. 7). In other words, meaning is lost if the behavior or cognition is removed from the situation where it happened. One analyzes the function served by the emotion, cognition, or behavior within a specific context. In addition, relational frame theory (RFT) posits that "functions given to one member of related events tend to alter the functions of other members" (Hayes, 2004, p. 11). A cognition, behavior, and/or emotion experienced or learned in one context may affect the function in another context.

Gifford, Hayes, and Strosahl (2004) outlined the main components of ACT as (1) creative helplessness (the futility of current efforts to feel better), (2) cognitive diffusion (our thoughts are just thoughts, not what we interpret them to be), (3) acceptance (allow experience to be what it is while effectively engaged), (4) self as context (identify with the observer of thoughts), and (5) valuing (rededicate one's life to what gives life meaning) (as cited in Germer, 2005, p. 125). Embedded within ACT's components are the key aspects of acceptance and commitment, which are cultivated through the practice of specific exercises.

According to Hayes (1994) ACT explicitly teaches clients not to attempt to control thoughts and feelings, but to observe them nonjudgmentally and to accept them as they are while changing their behaviors in constructive ways to improve their lives (as cited in Baer, in press, p. 5). ACT utilizes mindfulness techniques to teach clients to view their cognitions, emotions, and sensations as an outside observer rather than identifying with them. There is a myriad of techniques within ACT, and those chosen are dependent upon the unique needs of the client. For example, one exercise has the client imagine a parade is occurring in front of them, and his/her thoughts are written on the signs carried by those

in the parade. The client is instructed to see himself or herself as an outsider viewing the parade rather than as a participant, and to take note if the mind begins to wander. Other techniques are used to specifically cultivate the various components of ACT. Acceptance exercises include the Serenity Prayer ("change what we can, accept what we can't change") and journaling about painful events, while experiential exercises are used to cultivate mindfulness (Germer, 2005). Through the definition provided by Hayes and the techniques utilized it is apparent that several of the mindfulness facets identified by Baer and colleagues, those of 'nonreactivity to inner experience', 'observing', and 'nonjudging of inner experience' are being cultivated within ACT. Initial research of ACT shows promise instilling both acceptance of and commitment to participants' presenting issues.

Vowles and McCracken (2008) studied the effectiveness of ACT in the treatment of chronic pain and examined two processes from the model, acceptance and values-based action (p. 397). Included in the study were 145 participants in a three-week course and 42 individuals who participated in a four-week course. ACT consisted of five days of treatment per week, lasting 6.5 hours per day. Sessions for each day consisted of 2.25 hours of physical conditioning and 1.5 hours of psychological content, including mindfulness training. To be included, participants had to meet specific criteria, including persistent pain of longer than three months duration, significant levels of pain-related distress and disability, and agreement with the rehabilitative (as opposed to curative) goals of treatment (Vowles & McCracken, 2008, p. 398). One hundred seventy-one participants provided data pre- and post-treatment, with 114 providing data at a three-month follow-up appointment. They completed a battery of pre- and post-treatment questionnaires, including the Chronic Pain Acceptance Questionnaire (CPAQ), Chronic

Pain Values Inventory (CPVI), British Columbia Major Depression Inventory (BCMDI), Pain Anxiety Symptoms Scale-20 (PASS), and the Sickness Impact Profile (SIP). Two-minute walking tasks and a sit-to-stand task provided information on physical performance. Immediately following treatment and at follow-up, participants achieved significant reductions in depression, pain-related anxiety, disability, and healthcare use and significant improvements in physical performance measures. In addition, researchers found improvement in both acceptance and values-based action.

In another study, Twohig, Shoenberger, and Hayes (2007) were interested in the effect an abbreviated version of ACT would have on those who met criteria for marijuana dependence. The participants were recruited voluntarily through postings on a local university and announcements in undergraduate psychology classes. Of the five participants who responded, three were included in the study, the remaining two participants were not included due to time constraints and work. Measures utilized included intake self-monitoring, oral swab tests, Marijuana Withdrawal Checklist (MWC), Beck Anxiety Inventory (BAI), Beck Depression Inventory-II (BDI-II), and the Acceptance and Action Questionnaire (AAQ). The abbreviated ACT program was tailored for marijuana use and consisted of eight-weekly, 90-minute sessions. Results indicated that all participants were abstinent from marijuana use, while at a three-month follow-up one participant remained abstinent while the remaining two participants reported marijuana use at a reduced level compared to pretreatment.

Dialectical Behavior Therapy (DBT). Dialectical Behavior Therapy is yet another form of therapy utilizing concepts of mindfulness similar to ACT. DBT has roots in dialectics, which views reality as opposing forces which, when "synthesized", result in the

emergence of a new reality. Once a new reality emerges, the process of change continues. Within DBT, the focus is on the dialectic of acceptance and change, which comprises the opposing forces. Baer (in press) described how clients are encouraged to accept themselves, their histories, and their current situations exactly as they are, while working intensively to change their behaviors and environments in order to build a better life (p. 4).

DBT, developed for treatment with those with borderline personality disorder, focuses on the concepts of acceptance and change. As described by Robins, Schmidt III, and Linehan (2004) the practice of the client is shaped into increasingly effective behavior, and the therapeutic relationship becomes an integral part of the environmental response (p. 37). In other words, the therapeutic relationship serves as a microcosm in which the client can develop more appropriate responses to the flux of inter- and intrapersonal experiences of life. In addition to cognitive behavioral procedures, mindfulness skills are taught to clients. Robins and colleagues (2004) stress the importance of mindfulness within DBT stating that "dialectical theory all but demands mindfulness as a critical element" (p. 38). The concept of acceptance and change reflects the facets of 'nonreactivity to inner experience', 'observing', and 'nonjudging of inner experience' identified by Baer and colleagues, but not 'describing'.

Similar to ACT, DBT does not utilize mindfulness as a core component. For those who may have severe impairment or are reluctant to meditate, exercises are chosen based upon the discretion of the client and therapist, and there are numerous exercises from which to choose. Several exercises utilize focusing on the breath, as previously discussed, while other exercises require the client to use their imagination. For example, clients may be asked to "follow the breath in and out" or "imagine that the mind is the sky, and that

thoughts, feelings, and sensations are clouds that they watch pass by" (Baer, in press, p. 4). Researchers have applied DBT to those with a diagnosis of borderline personality disorder and/or a substance-related disorder successfully.

Linehan and colleagues (1999) were interested in applying DBT for treating women with dual diagnoses, borderline personality disorder (BDP) and a substance disorder. Twenty-eight participants were included in the study, and were placed in either DBT or treatment as usual (TAU). To participate, participants met criteria for a diagnosis of both BDP and a substance or poly-substance use disorder. DBT treatment included weekly individual psychotherapy (one-hour), group skills training sessions (two-hours plus a 15-minute wind-down), skills coaching phone calls with the primary therapist (when needed), and weekly team meetings of all therapists (Linehan et al., 1999, p. 281). DBT was adapted to also address substance abuse issues with participants. Finally, for those dependent upon a stimulant or opiate there was a transitional period with appropriate medication. When comparing DBT to TAU participants, the researchers found a significant reduction in substance use. DBT-participants were also more likely to complete the program, with a significant improvement in global and social adjustment.

Both Baer (2003) and Bishop (2002) conclude that enough evidence has now accumulated to warrant the development of more methodologically rigorous investigations of both the clinical efficacy of mindfulness training in various specific disorders and the possible mechanisms and pathways through which it might exert characteristic effects within those specific disorders (Kabatt-Zinn, 2003, p. 145).

In light of the current research and the cost of health care, and the impact on society, it is of import to further investigate promising prevention/intervention programs

which may aid in identifying factors leading to use, abuse, dependence, and relapse of alcohol and other drugs. Mindfulness, not only a cost effective treatment, is utilized in a variety of areas for problematic issues with positive results. Research has shown programs developed for both physical and mental health issues, ranging from anxiety, depression, psoriasis and chronic pain to have positive results. And unlike other forms of treatment, mindfulness is not dependent on one's theological beliefs, a practice which may inadvertently turn some individuals away from treatment. As stated by Kabat-Zinn (2005):

> "And since there is nothing particularly Buddhist about paying attention or about awareness, nor anything particularly Eastern or Western, or Northern or Southern for that matter, the essence of mindfulness is truly universal. It has more to do with the nature of the human mind than it does with ideology, beliefs, or culture" (p. 110).

Importance of identifying the mechanisms of mindfulness. In reviewing the various mindfulness-based therapies we see each form of therapy targeting one or more facets of mindfulness. For example, both MBSR and MBCT emphasize the cultivation of all five facets, while ACT and DBT develop three of the five facets, that of 'nonreactivity to inner experience', 'observing', and 'nonjudging of inner experience', but not 'acting with awareness' or 'describing'. Though we are unclear as to which facet is responsible for the successful application of mindfulness within these programs, it is this need to identify what possible mechanisms or pathways mindfulness takes in preventing or influencing addictive behaviors that will aid treatment providers who are particularly interested in using mindfulness as a form of intervention in setting targets and refining their

therapeutic programs. For this study, we were interested in determining which facets of mindfulness predict the extent to which a person avoids or is resistant to alcohol-related disorders.

Understanding Substance-Related Disorders

The World Health Organization (2003) reported that the prevalence of alcohol use disorders was estimated at 1.7 percent globally, and that these disorders accounted for 1.4 percent of the total world disease burden (as cited in Grant et al., 2006, p. 79). The cost of substance-related disorders is substantial, not only for the afflicted but for those surrounded by the individual and society as a whole. Approximately one in four children under 18 years old in the United States is exposed to alcohol abuse or alcohol dependence in the family (Grant, 2000, as cited in Grant et al., 2006, p. 79). Of the 11.1 million victims of violent crime each year, almost one in four, or 2.7 million, report that the offender had been drinking prior to the crime (Greenfield, 1998, as cited in Grant et al., 2006, p. 80). Burdens upon the healthcare system are also a concern. The economic costs of alcohol abuse and dependence were $184.6 billion for 1998 (the last year for which figures were available), or roughly $638 for every man, woman, and child living in the United States (Harwood, 1998, as cited in Grant et al., 2006, p. 80). The cost of substance-related disorders upon society and the economy speaks ever more for the need of empirically supported and cost effective treatment programs.

Substance-related disorders include those that involve taking a drug of abuse (including alcohol), to the side effects of a medication, and to toxin exposure (American Psychiatric Association, 2000, p. 191). It is important to take note that diagnoses of abuse or dependence are appropriate for any psychoactive substance regardless of its legal

standing. For the purpose of this study we will be focusing on substance abuse and dependence related to alcohol consumption.

Features of substance abuse and dependence. The essential feature of substance dependence is a cluster of cognitive, behavioral and physiological symptoms indicating that the individual continues use of the substance despite significant substance-related problems (American Psychiatric Association, 2000, p. 192). For a diagnosis of substance dependence to be warranted an individual must meet three or more criteria at any time in a 12-month period. According to the American Psychiatric Association (2000) these criteria include: (1) tolerance; (2) withdrawal; (3) substance is often taken in larger amounts or over a longer period than intended; (4) persistent desire or unsuccessful efforts to cut down or control substance use; (5) a great deal of time is spent in activities necessary to obtain, use, or recover from the effects of the substance; (6) important social, occupational, or recreational activities are given up or reduces because of the substance; and (7) the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance (p. 197). For example, an individual would warrant such a diagnosis if they were missing work, unable to control the intake of alcohol, and needed more of the alcohol to feel its effects in the same 12-month period.

The American Psychiatric Association (2000) describes the essential feature of substance abuse as a maladaptive pattern of substance use manifested by recurrent and significant adverse consequences related to the repeated use of substances (p. 198). For a diagnosis of substance abuse to be warranted, an individual must meet one or more criteria within a 12-month period and the American Psychiatric Association (2000) criteria

include: (1) recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home; (2) recurrent substance use in situations in which it is physically hazardous; (3) recurrent substance-related legal problems; and (4) continued substance use despite having a persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (p. 199). In addition, the individual should not have had a previous diagnosis for substance dependence for the same class of substance. For example, an individual would warrant such a diagnosis whether or not they received a ticket for Driving Under the Influence (DUI). Also, one would not receive a diagnosis of substance abuse for alcohol if they had previously received a diagnosis of substance dependence for alcohol.

Theories of addiction. Different camps have developed to understand addiction, each providing different views on how addiction develops and the best way to address the issue. The most widely researched viewpoints include the disease theory, systems theory, the cognitive behavioral approach, the psychodynamic approach, object-relations theory, and the existential-humanistic perspective.

The disease theory posits that alcoholism and drug addiction is a disease stemming from a biological substrate, which can be structural, chemical, neuropsychological, physiological, electrophysiological or genetic (Dudley-Grant, 2003, p. 114). Although an exact gene has not yet been identified, there are studies indicating a strong link between family members, including twin and adoption studies.

Within systems theory the role of the family and the environment in which children are raised is the focus. According to Dudley-Grant (2003) studies show a higher prevalence for addiction for those who have a family history of a substance-related

disorder, particularly for sons of alcoholic fathers, and the environment in which one lives is also recognized in the maintenance of a substance-related disorder.

The cognitive-behavioral model of addiction theory draws upon early learning and environmental experiences that negatively influence the individual (Dudley-Grant, 2003, p. 114). These early experiences impact the individual's self-image and cognitions, which in turn affect their behavior.

Psychodynamic theories focus on unconscious processes that feed the addictive behavior. Dudley-Grant (2003) reported that "from a psychoanalytic standpoint, the addict can be considered to be one who is trapped in infantile, narcissistic repetition compulsion where immediate gratification of impulses is the sole method of functioning" (p. 115). In the oral phase of development the individual focuses on the fulfillment of his/her own needs, and is unable to delay gratification.

Originating within psychoanalytic theory, object relations theory addresses how early relationships with caregivers and others in one's life impacts the view of oneself and future relationships, as well as our overall well-being. Gurney and Rogers (2007) stated that "we internalize our relationships with our primary caregivers and use these relationships to form object representations, or views of others and ourselves (p. 2). The object-relations theory perspective views the addict as attempting to prolong a continuous state of happiness and pleasure through the use of alcohol/drugs, while replacing the lost object simultaneously. Henry Krystal believed the primary cause of addiction was the result of a failure to individuate and separate from the primary caregiver (Morgenstern & Leeds, 1993). The failure to develop properly resulted in the individual having a distorted view of relationships and an inability to care for oneself. In addition, Krystal viewed

addicts as having a low affect tolerance. Krystal believed addicts showed characteristics of alexthymics, in varying degrees. For alexthymics, affective arousal is uncomfortable and poorly tolerated, leading to various efforts to eliminate it either by sedation or rapid discharge (Morgenstern & Leeds, 1993, p. 200).

The Existential-Humanistic perspective perceives addiction as a way to avoid one's own subjective experiences. From this point of view, the individual lack of coping mechanisms lead to a use of alcohol and other drugs as a way to provide temporary relief and/or an escape from that which the individual deems to be uncomfortable and/or threatening to his/her way of being. Unfortunately, this way of "being" eventually leads to a physiological addiction, allowing further avoidance of subjectivity as the addiction is brought to the foreground (Paul & Lucas, 2005). Transitioning from an objective to subjective analysis, which "includes attending to one's thoughts, perceptions, emotions, preferences, interests, intentions, hopes, and fears" (Paul & Lucas, 2005, p. 50), will assist the addict in identifying reasons for use/abuse and lead to authentic experiences.

Interventions for Addiction

There are numerous treatments available for those with addictions, and further investigation brings to light those components which parallel the five facets of mindfulness. A few of the treatments available are Cognitive-Behavioral Therapy, Brief Interventions, Motivational Enhancement Therapy, and use of the 12-steps mode.

Under the umbrella of Cognitive-Behavioral Therapy there is Relapse Prevention (RP), Alcohol Behavioral Couples Therapy (ABCT), and Cognitive Behavioral Coping-Skills Therapy (CBST), to name a few approaches. While each of these treatments differs to some extent they generally share the same overarching goals. For

example, each intervention will focus on how our thoughts, emotions, and behaviors impact our decision making. In addition, clients will learn how these experiences may also serve as triggers to use and/or relapse. The goals of CBST and ABCT parallel the facets 'observing', 'nonreactivity to inner experience', and 'nonjudging of inner experience', clients learn to observe their experiences while simultaneously refraining from judging and reacting impulsively to these experiences, while the goals of RP parallel the facets of 'nonreactivity to inner experience' and 'observing'.

Another treatment approach is Brief Intervention (BI), which attempts to raise the addict's level of awareness and provide advice on how to address the problematic behavior. The goals of BI parallel the facet of 'acting with awareness'. Those providing the intervention are attempting to increase the addict's level of awareness regarding how their choices are negatively influencing their mind and body.

Motivational Enhancement Therapy (MET) combines two treatment approaches, that of Brief Motivational Intervention (BMI) and Motivational Interviewing (MI). Motivational Enhancement Therapy attempts to raise the level of motivation within the participant, while simultaneously increasing their level of awareness as to the negative effects of their current behavior. While the goal of BMI parallels the facet of 'acting with awareness' and MI goals parallel the facets of 'nonjudging of inner experience' and 'observing', MET benefits from raising all three of the identified mindfulness facets through its combination of the approaches.

There are also those treatments which draw from the 12-steps of Alcoholics Anonymous (AA). McCrady, Epstein, and Kahler (2004) described AA as "providing a social network that is supportive of recovery as well as positive close relationships" (p.

870). Additionally, there is the 12-Step Facilitation (TSF) which draws heavily from the 12-steps of AA. TSF views alcoholism "as a disease of the spirit, mind and body" (Brown, Seraganian, Tremblay, & Annis, 2002, p. 680). The authors go on to explain that although TSF follows each of the 12-steps there is a larger focus upon steps 1-3. Humphreys (1999) noted the aim of TSF is acceptance and surrender. The author reported participants are to accept alcoholism as a disease, he/she has lost control over his/her drinking, and abstinence is the only option because there is no cure. The goal of surrender refers to the acceptance of a higher power for help and following the 12-steps of AA. Although the goals of TSF does not formally fit with the identified facets of mindfulness, the concept of acceptance does fall in-line with those who have defined mindfulness as "bringing one's complete attention to the experiences occurring in the present moment, in a nonjudgmental or accepting way" (Brown & Ryan, 2003; Kabat-Zinn, 1990; Linehan, 1993; Marlatt & Kristeller, 1999, as cited in Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006, p. 27). Clients in TSF and AA are taught to accept their current situation and focus on what can be done to prevent relapse.

Comorbidity. According to the National Survey of Drug Use and Health about 5.2 million adults in the U.S. have a co-occurring substance use disorder and serious psychological distress (as cited in Magura et al., 2008, p. 62). Comorbidity refers to the presence of two co-occurring disorders; for the purpose of this discussion comorbodity will refer to a substance-related disorder and another mental health diagnosis. Difficulty arises regarding the proper diagnosis and treatment for those suffering from more than one mental health issue. As discussed by Kay-Lambkin, Baker, and Lewin (2004) symptoms do not necessarily have to meet diagnostic conditions according to the Diagnostic and

Statistical Manual for the individual to experience issues within his/her life. For example, an individual may meet diagnostic criteria for a substance-related disorder, but not the number of symptoms or duration of symptoms for a mood disorder. Treatment would be provided for the addiction, but overlooked for the mood disorder; increasing the possibility of relapse. Concerns for the proper diagnosis bring us to the concerns for the proper treatment for those who have a comorbid diagnosis. Kay-Lambkin and colleagues (2004) reported two of the five primary models used to conceptualize and treat comorbidity are secondary substance use models and secondary psychopathology models. Secondary substance use models believe use of alcohol or other drugs are the result of mental health issues, paralleling that of self-medication, whereas secondary psychopathology models view mental health issues stemming from the use of alcohol or other drugs of abuse. Generally, the primary diagnosis is treated and once it is manageable the secondary diagnosis will be addressed if deemed necessary. The question posed by Kay-Lambkin and colleagues (2004), and a concern for all mental health providers, is whether the primary or secondary diagnosis should be treated first, or simultaneously.

Regardless of the theory utilized in understanding a substance-related disorder and/or the intervention to treat the addiction, those afflicted suffer on both a physiological and psychological level. Within each theory one can see the roles both physiological and psychological aspects play in the development, maintenance, and recidivism of substance-related disorders. For example, the disease model takes into consideration the role genetics, neurotransmitters, and changes in the brain have on addiction, whereas systems theory and cognitive behavioral theory focus on the role of psychological and environmental factors in a substance-related disorder.

The Role of Mindfulness in Substance-Related Disorders

Various researchers have begun to explore how mindfulness affected individuals with psychiatric or substance-related disorders. The application of mindfulness resulted in positive effects on both a physiological and psychological level.

Physiological influence of mindfulness. Technological advances in brain imaging have provided researchers with additional information on how the brain is affected by drug and alcohol use. The neurotransmitter dopamine (DA), associated with inducing pleasurable experiences, appears to play a key role in addiction. Drugs and alcohol have been shown to affect the neurotransmitter differently, with some increasing the firing of DA while others block the reuptake. In either scenario the individual is left with a euphoric feeling. Schultz (1998) and Wickelgren (1997) noted the more recent suggestion that dopamine primarily serves to draw a person's attention to events that predict or signal reward, such as drug-related stimuli (as cited in Franken, 2003, p. 564). If so, this would have implications for addicted individuals who are unable to notice their internal and external experiences, as well as for those who act without awareness. For example, an individual who self-medicates will begin to experience symptoms of depression and instinctively reach for a bottle of alcohol to artificially improve their mood. Based upon Schultz (1998) and Wickelgren's (1997) suggestion the individual's attention would be drawn to alcohol because of the positive reinforcement he/she receives from consumption of alcohol. Therefore, one who scores low on the facets of 'observing' and 'acting with awareness' would not notice their shift in mood that triggers the desire to consume alcohol.

On a larger scale, researchers have taken note of specific areas of the brain affected by alcohol and other drugs of abuse. Of interest is the prefrontal cortex, which has been

thought to govern executive control over our behaviors. Kaufman, Ross, Stein, & Garavan (2003) noted that changes in the prefrontal cortex "could lead to impairments in self-monitoring and behavior control, playing an important role in the cognitive changes that perpetuate drug self-administration" (as cited in Volkow, Fowler, & Wang, 2004, p. 8). During acute intoxication with alcohol, nicotine and cocaine there is an activation of the orbitofrontal cortex, prefrontal cortex, anterior cingulate, extended amygdala and ventral striatum (Koob, 2006, p. 27). Activation of these areas of the brain results in an increase of dopamine activity, while withdrawal results in a reversal of the changes. With repeated drug exposure, the reinforcing effects of these drugs are due not only to pharmacological consequences but also to the learned conditioned responses and the enhanced saliency value that the individual acquires through experience (Volkow et al., 2004, p.4).

A recent study indicates mindfulness may have the ability to combat some of the physiological effects of alcohol and other drugs. Davidson and colleagues (2003) investigated the effects on brain and immune function of an eight-week clinical training program in mindfulness meditation. The authors cited previous research which has shown that "left-sided activation in several anterior regions is observed during certain forms of positive emotion and in subjects with more dispositional positive affect", as well as "recent studies establishing that greater relative left-sided anterior activation at baseline is associated with enhanced immune function using measures of NK activity (Davidson et al., 2003, p. 564). The authors noted that their focus on the electrical activity on portions of the brain is the result of previous research indicating meditation having the ability to decrease psychological symptoms and increase positive affect. Participants included 41

subjects, 25 in the meditation group and 16 in the wait-list control group from a biotechnology corporation in Madison, Wisconsin. Assessments included measures of brain electrical activity, blood draws following vaccination, between three- to five-weeks and again between eight- to nine-weeks, to measure antibody titers, the PANAS in trait form, after each writing period, the PANAS in state form, at each assessment, and the Spielberger State-Trait Anxiety Inventory in trait form. During the MBSR program participants met weekly for 2.5 to 3 hours, with a silent retreat lasting seven hours during week six. Participants received homework in which they meditated to an audiotape for one hour per day, six-days per week. Their results indicated significant increases in left-sided anterior activation and antibody titers when comparing the meditators to the nonmeditators (Davidson et al., 2003). In addition, a correlation was found between left-sided activation and the rise of antibody titers.

Psychological influences of mindfulness. There are also psychological effects which take place during the cultivation of mindfulness. Breslin, Zack, and McMain (2002) discussed the role of memory and attention in substance use and addiction, as well as the role mindfulness plays in sensitizing and desensitizing one to these changes. They noted:

> "We have proposed that mindfulness can sensitize attentional responses to negative affective stimuli so that automatic, potentially maladaptive responses, like memory network activation, do not proceed unchecked. At the same time, we have asserted that mindfulness can desensitize emotional responses to negative affective stimuli that are conscious but can also activate the drug-use memory network" (p. 290).

In the third section of their article the authors refer to information processing which focuses on the importance of memory and attention in use of alcohol and relapse to usage with any substance. The researchers cited two theories which discuss the role of memory. Baker, Morse, and Sherman (1986) argued that conditioned motivations are encoded in a memory network containing propositional information about drug-relevant and affective stimuli and responses to these stimuli (as cited in Breslin et al., 2002, p. 284). The theory revolves around both positive and negative affect systems where the individual's use stems from positive reinforcement, such as the euphoric effects of use, or negative reinforcement, such as avoidance of withdrawal. Breslin and colleagues also cite a theory by Tiffany (1990) where "most drug and alcohol use is presumed to be governed by memory-based, drug-use action plans established by repetitive, stereotyped drug use and operate automatically, that is, with little conscious awareness or effort" (as cited in Breslin et al., 2002, p. 284). Regardless of the theory, there is a focus on the activation of information within one's long term memory. Additionally, process models of memory universally recognize the role of attention as a gateway to memory; nothing is encoded into or retrieved from memory unless a modicum of attention is allocated to a target stimulus (Craik & Lockhart, 1972; Norman, 1968; Triesman, 1960, as cited in Breslin et al., 2002, p. 284), which has important implications when taking into consideration the nonjudgmental, open observation characteristic of mindfulness.

Breslin and colleagues' (2002) concept of sensitization focuses on the ability of mindfulness to cultivate one's awareness of factors which are both internal and external which may precipitate use, addiction, and/or relapse. They note that mindful deployment of attention, what Tiffany calls nonautomatic or effortful processing, contrasts directly

with the mindless or automatic allocation of attention driven by substance use memory networks (p. 287). The facet of 'nonreactivity to inner experience' is being cultivated. The individual does not attempt to stop or inhibit their cognitions, emotions, or behaviors; rather, they accept these internal or external factors as transient. Breslin and colleagues (2002) noted that two key benefits of mindfulness may be its ability to progressively replace automatic processing of drug-relevant stimuli with controlled, nonautomatic processing and to replace mindless emoting (the proximal cause of chronic reactivation) with detached observing (p. 288). There is a tendency for individuals to have an attentional-bias towards drugs/alcohol, which plays a significant role in the cycle of addiction, i.e., use, abuse, dependence and relapse.

Sharma, Albery, and Cook (2001) explored whether a patient group of problem drinkers selectively attend to alcohol-related stimuli and the time course of any interference from alcohol-related stimuli in comparison with two control groups of non-problem drinkers (p. 285). Their study consisted of two control groups, each comprised of 20 participants. These participants were then placed in a high or low drinking group, based upon their scores on the Alcohol Use Disorders Identification Test (AUDIT). The third group consisted of 20 participants who were in-treatment abstinent problem drinkers from a local community alcohol service (CAS) (Sharma et al., 2001, p. 288). Response latencies were measured by a modified Stroop color naming test and anxiety was measured by the State-Trait Anxiety Inventory. The authors noted three main findings in their study. First, those in the CAS group showed longer latencies to respond to the color of alcohol-related stimuli than matched neutral stimuli (Sharma et al., 2001, p. 292). In addition, those who were deemed as high problem drinkers also demonstrated

interference in responding to alcohol compared to neutral stimuli. Lastly, no substantive statistical evidence of habituation to alcohol-related stimuli was found in either the control or CAS groups (Sharma et al., 2001, p. 293).

In another study, Townshend and Duka (2001) investigated whether non-dependent heavy social drinkers would differ in selective attention towards alcohol-related stimuli in comparison with a group of occasional social drinkers (p. 67). Participants included 32 male and female university students, who were labeled as either a heavy or occasional social drinker. Those deemed heavy social drinkers were given the Alcohol Use Questionnaire (AUQ) and the occasional social drinkers were given the non-drinking questionnaire, which was specifically designed for them, while all participants completed the Alcohol Expectancy Questionnaire. Additionally, participants completed the dot probe task to assess attentional-bias, and higher-order executive function was measured with two cognitive tasks, recognition memory and attentional shift (Townshend & Duka, 2001, p. 67). The researchers found an attentional-bias toward alcohol-related pictures in the group of heavy social drinkers compared with occasional social drinkers.

The possibility of mindfulness having a desensitizing effect on those factors which trigger use or relapse is the focus of Breslin and colleagues' (2002) discussion. They refer to this effect as the "emotional tolerance function of mindfulness" (p. 288). The researchers apply Pavlovian, or Classical, conditioning in their discussion. Through Pavlovian conditioning, once neutral stimuli can become conditioned to elicit a response. In Ivan Pavlov's study, an unconditioned stimulus (US), food, would elicit an unconditioned response (UR), salivation, from canine. Next, a neutral stimulus, sound of a bell, which does not elicit a response, would be paired immediately before presenting the

US to the canine. In time the neutral stimulus, sound of the bell, becomes the conditioned stimulus (CS) which would elicit a response, salivating, on its own, now known as the conditioned response (CR). Although people are not animals, our behavior is governed in the same fashion. A once neutral external stimulus, such as a cigarette lighter, rolling papers, our favorite drinking glass, or a syringe, will begin to become cues, eliciting cravings from the individual as they are paired with the use of alcohol or drugs. Furthermore, the context in which one uses the substance may come to elicit a CR as well. For example, a once neutral stimulus such as a bar may later become a CR after the individual pairs the bar with drinking, in time eliciting feelings of craving. Also, due to generalization, the individual will experience craving when exposed to other bars as well. Generalization occurs when stimuli are similar enough to one another they elicit the same response. In addition to external cues, internal cues can become conditioned responses. For instance, a negative affective state, an uncomfortable physical experience, or a cognition which is deemed inappropriate may trigger use/relapse to avoid the experience. A mindful stance towards cues will expose the individual to unpleasant experiences, rather than taking a stance of avoidance or thought suppression. As cited in Breslin and colleagues (2002, p. 291) "strategies to avoid negative affect such as distraction or suppression appear to have paradoxical effects on attention and memory (Wegner, Schneider, Carter, & White, 1987) and are associated with increased symptoms (Wegner & Zanakos, 1994). From a cognitive-behavioral view, the process of exposure will lead to the gradual habituation of cues. Marlatt and Kristeller (1999) refer to this process as "urge surfing", (as cited in Breslin et al., 2002, p.292), which parallels the concept of impermanence, or the transient state of all experiences. Clients are encouraged to imagine

their experiences as waves, "which grow gradually until they crest and subside" (Baer, in press, p. 5). Through mindfulness, the individual will allow their cognitions and/or affect to arise, engaging in nonjudgmental open-observation of the experience. Research on cue exposure and experiential avoidance reinforce the importance of attending to both internal and external cues as a means to effectively extinguish conditioned responses.

Carter and Tiffany (1999) conducted a meta-analysis from 41 cue-reactivity studies that compared responses of alcoholics, cigarette smokers, cocaine addicts or heroin addicts to drug-related versus neutral stimuli. To ensure homogeneity the researchers included only those studies which met certain criteria. Those included were a) reported in a published forum; b) the study must have employed an addict sample (such as alcoholics, smokers, heroin addicts, cocaine addicts) as participants; and c) the research must have presented the addict sample with both a drug-related and neutral-control stimuli (Carter & Tiffany, 1999, p. 330). The researchers analyzed data provided by the previous studies, which included heart rate, sweat gland activity, skin temperature, and subjective craving. Their meta-analysis indicated that current cue-reactivity research designs can elicit increases in self-report of craving and significant physiological reaction in smokers, alcoholics, heroin addicts, and cocaine addicts exposed to drug-related stimuli (Carter & Tiffany, 1999, p. 333).

In another study, Cooney, Litt, Morese, Bauer, and Gaupp (1997) were interested in whether cue exposure and negative mood "would produce stronger drinking urges and physiological changes than either condition presented alone, and whether reactivity to these conditions would predict alcohol consumption after treatment" (p. 244). Their focus coincides with literature discussing the negative impact of experiential avoidance, defined

as the phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996, p. 1154). Their participants included 50 males with a primary diagnosis of current alcohol dependence, based upon the DSM-III-R, admitted to treatment at the substance abuse programs of the Veterans Affairs (VA) Connecticut Healthcare System, Newington campus or the West Haven Campus. Participants completed a battery of questionnaires, ranging from assessment of mood to subjective report of craving, as well as physiological data being recorded. The study consisted of three laboratory sessions in which the first session was used to familiarize participants to the laboratory and procedures. In the second and third sessions participants were read either a neutral- or a negative-mood guided imagery script and were then exposed separately to both spring water and an alcoholic beverage (Cooney et al., 1997, p. 245). Afterwards, a three-month follow up was conducted to assess relapse. Their results indicated cue reactivity as a mechanism of relapse may occur in only a subset of individuals, and mood states are among the stimuli that can trigger desire to drink, even when alcoholic beverages are not present (Cooney et al., 1997, p. 249).

In sum, mindful attention to drug-relevant cues or triggers coupled with a conscious, nonavoidant behavioral response may desensitize the individual to the impelling effects of emotional states even as it promotes awareness of those states (Breslin et al., 2002, p. 288). Cultivating specific facets of mindfulness, as identified by Baer and colleagues, may play a vital role in the prevention of relapse for those identified as having

a substance-related disorder.

Clinical application of mindfulness in addiction. A review of past and current literature regarding the application of mindfulness within a substance-related disorder population yields few results. Results of available literature yield both positive and mixed results. Although there are a limited number of investigations, researchers have begun to speculate on the application of mindfulness and other empirically supported techniques.

Bowen and colleagues (2006) evaluated the effectiveness of a "vipassana" meditation (VM) course on substance use and psychosocial outcomes in an incarcerated population (p. 343). Participants were recruited from a North Rehabilitation Facility, a minimum security adult jail in Seattle Washington. Participants were placed in either the "vipassana" meditation course or treatment as usual. Assessment information was gathered at baseline (63 for VM and 242 for TAU), post course assessment (57 for VM and 116 for TAU), post release three-month assessment (29 for VM and 58 for TAU), and a six-month assessment (27 for VM and 51 for TAU) (Bowen et al., 2006, p.344). A battery of questionnaires were utilized to measure quantity and frequency of alcohol and drug use, impulsivity and consequences of use, perceptions of control over use, thought suppression, and psychiatric severity of symptoms. Their results, a significant relationship between participation in the VM course and post-incarceration substance use, such that NRF residents who participated in VM reported significantly less use of each substance and significantly fewer alcohol-related negative consequences three months following release from NRF (Bowen et al., 2006, p.346). In addition, the researchers found those who participated in the "vipassana" course reported significantly lower levels of psychiatric symptoms, more internal alcohol-related locus of control, and higher levels of optimism

(Bowen et al., 2006, p. 346).

In another study, Alterman, Koppenhaver, Mulholland, Ladden, and Baime (2004) were interested in the effectiveness of mindfulness as an adjunctive treatment for substance abuse patients (p. 260). Participants included 31 men and women who were residents of a recovery house in Philadelphia and had been in treatment for up to two-months (Alterman et al., 2004, p. 260). Eighteen of the participants were randomly placed in an eight-week group receiving mindfulness meditation plus standard treatment, and 13 participants received standard treatment. Assessments included a measure of substance-abuse-related problems, as well as a measure of positive psychological states at baseline and at the eighth week and fifth month post-study entry (Alterman et al., 2004, p. 263). The results were not significant, though they did discuss several limitations of their study which may have contributed to the non-significant findings. The authors reported adding mindfulness to TAU made finding a significant effect more difficult. In addition, the authors noted approximately half of those who were in the mindfulness group reported meditating around four hours during the fifth month, which could indicate their measures did not detect some benefits (Alterman et al., 2004).

While studies are limited and they provide mixed results, researchers have begun to speculate about programs developed around mindfulness and other forms of treatment. Witkiewitz, Marlatt, and Walker (2005) have done so in their article *Mindfulness-Based Relapse Prevention for Alcohol and Substance Use Disorders.* In their article the authors discuss the integration of cognitive-behavioral relapse prevention with mindfulness meditation. The goal of this relapse prevention is to develop awareness and acceptance of thoughts, feelings, and sensations through practicing mindfulness and to utilize these

mindfulness skills as an effective coping strategy in the face of high-risk situations (Witkiewitz et al., 2005, p. 221). The focus of their proposed treatment is prevention of relapse and knowledge of situations leading to relapse. Participants are educated on substance-related cues, and mindfulness techniques, such as the breath exercise. Witkiewitz and colleagues (2005) note:

> "Repeated exposure to being mindful in high-risk situations without giving into the temptation to engage in substance use or acting impulsively in the presence of substance-related cues will lead to increased self-efficacy and the counter conditioning of the positive and negative reinforcement previously associated with the effects of an addictive substance" (p. 223).

It appears as though the applications of mindfulness in regards to substance-related disorders as well as the understanding of the mechanisms of mindfulness which produce change are still in infancy. By identifying the facets that best predict use and abuse we can begin to fully understand its operation.

Purpose and Significance of the Study

The purpose of this study was to identify which facets of mindfulness best predict the extent to which a person is avoidant of or resistant to alcohol–related disorders. Once the predictors are identified it is possible to understand which specific mechanisms or pathways that mindfulness may be taking in the prevention of or in influencing alcohol abuse.

Hypotheses

The study predicted that the facets of 'acting with awareness', 'nonreactivity to inner experience', 'nonjudging of inner experience', and 'observing' will be predictive of

the level of alcohol abuse and dependency. Specifically, people who have a tendency to act with awareness, who are non-reactive, non-judgmental, and observant of their emotions, actions, and experiences are less likely to engage in alcohol abuse. This hypothesis was based upon the literature regarding experiential avoidance and Pavlovian conditioning. Those who act impulsively, are unable to notice how their emotions influence their thoughts and behaviors or how cues lead to use, who routinely engage in automatic behavior, and who judge themselves harshly for their experiences will more likely utilize alcohol as an avoidance technique. 'Describing' was not expected to be a significant predictor because literature has not pointed to the importance of being able to put into words one's feelings in regards to substance-related disorders.

Secondly, it was predicted that the facet of 'nonreactivity to inner experience' would account for the most variance, followed by 'acting with awareness', 'observing', 'nonjudging of inner experience' and 'describing', respectively. Though it is important for individuals to be aware of their experiences, to refrain from judging their experiences, to observe their experiences, and to express their feelings verbally, those who are unable to refrain from acting impulsively will most likely utilize alcohol maladaptively.

Method

Participants

One hundred five Eastern Illinois undergraduate students participated in the study. Twenty-seven were male and 78 were female. Participants' ages ranged from 18 to 57 years old ($M = 19.75$, $SD = 4.36$). Eighty-six percent of participants identified themselves as White/Caucasian, 10% as Black/African-American, 2% Hispanic, 1% Hawaiian or Pacific Islander, and 1% Other.

Materials

Questionnaires utilized were self-report instruments assessing mindfulness and substance-related disorders, more specifically issues related to alcohol use.

Five Facet Mindfulness Questionnaire (FFMQ). The FFMQ, developed by Baer and colleagues (2006), is a 39-item self-report instrument assessing the multidimensional construct of mindfulness on five identified facets. A score is provided individually based upon the facets, 'observing', 'describing', 'acting with awareness' ('actaware'), 'nonjudging of inner experience' ('nonjudge'), and 'nonreactivity to inner experience' ('nonreact'). Respondents endorsing the item "I notice the smells and aromas of things", for example, would score higher on the 'observing' facet. Those agreeing with the item "I am good at finding words to describe my feelings" would score higher on the 'describe' facet. Those endorsing items, such as, "I find myself doing things without paying attention" and "I think some of my emotions are bad or inappropriate and I should not feel them", which are reversed scored, would have lower scores on the 'acting with awareness' and 'nonjudging of inner experience' facets, respectively. Respondents agreeing with the item "I perceive my feelings and emotions without having to react to them" would score higher on the facet 'nonreactivity to inner experience'.

Respondents rate items based upon a 5-point Likert-type scale, ranging from 1 (Never or very rarely true) to 5 (Very often or always true). When scoring, items 12, 16, 22, 5, 8, 13, 18, 23, 28, 34, 38, 3, 10, 14, 17, 25, 30, 35, and 39 are reverse scored. The 'observing' facet is comprised of items 1, 6, 11, 15, 20, 26, 31, and 36, ranging from a score of 0 to 40. The 'describing' facet consists of items 2, 7, 12, 16, 27, 32, and 37, scores ranging from 0 to 35. 'Acting with awareness' items are 5, 8, 13, 18, 23, 28, 34, and 38,

scores ranging from 0 to 40. Items comprising the facet 'nonjudging of inner experience' are 3, 10, 14, 17, 25, 30, 35, and 39, scores ranging from 0 to 40. The 'nonreactivity to inner experience' items include 4, 9, 19, 21, 24, 29, and 33, scores ranging from 0 to 35. Baer and colleagues (2006) reported adequate to good internal consistency, alpha coefficients obtained were, 'nonreactivity to inner experience' = .75, 'observing' = .83, 'acting with awareness' = .87, 'describing' = .91, and 'nonjudging of inner experience' = .87 (p. 36).

Index of Alcohol Involvement (IAI). The IAI is a 25-item self-report instrument, developed by Hudson and Garner (1990). The instrument measures the degree or magnitude of problems an individual may be having because of his or her use of alcohol (MacNeil, 1991, p. 68). The measure is not designed around a particular theory of abuse/dependence; rather it includes items from all areas which would indicate problems with alcohol consumption.

The IAI produces a score ranging from 0 to 100. Low scores indicate the presence of little or no respondent dysfunction due to the use of alcohol, and higher scores indicate the presence of a greater degree or amount of such dysfunction (MacNeil, 1991, p. 70). Respondents endorse items on a scale of 1 (Never) to 7 (Always). Of the 25 items, 22 are structured as problematically worded statements about the use of alcohol; items 5, 20, and 23 are not worded as problematic in regards to use of alcohol. Of the 25-items, the three nonproblematic items are reversed scored by changing a score of 1 to 7, 2 to 6, 3 to 5, 5 to 3, 6 to 2, and 7 to 1; a score of 4 is not changed (MacNeil, 1991, p. 70).

In a study by MacNeil (1991) the IAI was found to have a reliability (coefficient alpha) of .90. In addition, the IAI was found to have a low standard error of measurement

(4.61). MacNeil (1991) noted if the best estimate of the SEM is taken to be the pooled within-group estimate, these findings indicate that, on the average, a person's obtained IAI score will fall within ±3.3 points of the true score approximately 95% of the time (p. 71).

Alcohol Use Disorder Identification Test (AUDIT). The AUDIT is a 10-item measure developed by the World Health Organization (WHO), which can be used in either a questionnaire or interview form. The measure was specifically designed to identify people with hazardous or harmful alcohol consumption before physical dependence or chronic physical or psychosocial problems had arisen (Conigrave, Saunders, & Reznik, 1995, p. 1480). Responses to items are scored from 0 to 4, and total scores range from 0 to 40. Scores of eight or more are recommended as indicators of hazardous and harmful alcohol use, as well as possible alcohol dependence (Babor, Higgins-Bidle, Saunders, & Monterio, 2001, p. 19). Types of responses to items vary depending upon the item. For example, the third item, "How often do you have six or more drinks on one occasion?", include "Never", "Less than monthly", "Monthly", "Weekly", and "Daily or almost daily". Other items include; "How often during the last year have you found that you were not able to stop drinking once you had started?" and "Have you or someone else been injured because of your drinking?"

Babor and colleagues (2001) noted the AUDIT differs from other self-report tests because it is based on data collected from a large multinational sample, it uses an explicit conceptual-statistical rationale for item selection, emphasizes identification on hazardous drinking, and focuses primarily on symptoms occurring during the recent past (p. 11). Two studies have shown the AUDIT to have good internal reliability with a Cronbach's alpha coefficient of .80-.86 (Fleming, Barry, & MacDonald, 1991; Barry & Fleming, 1993;

as cited in Conigrave et al., 1995, p. 1480).

Procedure

Participants accessed the battery of questionnaires through The Experiment Management System, known as SONA, which is a system for gathering survey data online. Informed consent was collected and a brief description of the study, explaining what would be expected of participants, was provided. Participants were informed they could withdrawal from the study at anytime. In addition, participants were encouraged to respond openly and honestly to each presenting question, and information collected would be completely confidential. Participants were then presented with a brief demographic questionnaire, followed by the three measures, the FFMQ, the IAI, and the AUDIT. The scales were presented in a counterbalanced fashion to avoid any order effects. After completion of the packet of measures participants were then provided with a debriefing, in addition to contact information should additional questions/concerns arise at a later time.

Results

The dependent and/or predicted variable was alcohol misuse. The independent and/or predictor variables were the five facets of mindfulness; 'acting with awareness', 'observing', 'nonjudging of inner experience', 'nonreactivity to inner experience', and 'describing'. Given that there were two measures of alcohol misuse, two separate multiple regressions were performed.

Participants' FFMQ scores fell within the middle range for each of the five identified facets. The FFMQ scores indicate that participants are able to observe and verbally express their affect/cognitions, are aware of their internal and external experiences, refrain from being to judgmental in regards to their affect/cognitions, and are

less likely to act impulsively. They are neither deficient nor adept (as a skilled meditator would be) at each of the dimensions of mindfulness. These FFMQ scores appear to reflect a non-meditating sample of individuals. See Table 1 below.

Based upon the range of scores for the IAI, participants scored relatively low, indicating few to no problems with alcohol use. According to the AUDIT manual, however, scores of eight or more indicate alcohol misuse. The participants' mean score of 8.42 seems to indicate that there is a tendency to engage in alcohol misuse. See Table 1 below.

The discrepancy between the questionnaires measuring alcohol misuse may primarily be due to several factors. First, the IAI has approximately three times the number of items in comparison to the AUDIT. The increased number of items presents the opportunity for different variations of the same item. For example, items 2, 12, 20, and 22 each deal with an objective view of the participant's drinking. By presenting different variations of the same item, respondents may admit to having a drinking issue on one item but deny or overlook it on a variation of that item. For example, a participant's friend may not verbally express he/she has a drinking problem, such as in items 2, 12, and 20, but the participant may notice his/her friends choose not to be around when he/she drinks, such as in item 22. Secondly, as detailed in the questionnaires description, the IAI was not developed around a particularly theory, and items were developed from all areas which would indicate problematic use, whereas the AUDIT was designed to identify those with hazardous or harmful drinking patterns. If so, the AUDIT may be a more sensitive measure at detecting alcohol-related issues.

Predicting Alcohol Misuse (AUDIT) from the Five Facets of Mindfulness: Acting with awareness, Nonjudging of inner experience, Nonreactivity to inner experience, Observing, and Describing.

A multiple regression analysis using a stepwise selection procedure was used to determine the relationship between one's level of awareness, 'actawaring with awareness', 'nonjudging of inner experience', 'nonreactivity to inner experience', 'observing', and 'describing', and alcohol misuse as measured by the AUDIT. Results show that the facets 'observing' and 'acting with awareness' accounted for 13% of the variance in overall alcohol misuse, $F(2, 102) = 7.25$, $p < .001$. The 'observing' facet accounted for most of the variance (6%), $p < .009$. The facet 'acting with awareness' accounted for the remaining variance (4%), $p < .03$. A summary of the results for the multiple regression analysis is found in Table 2 below.

Predicting Alcohol Misuse (IAI) from the Five Facets of Mindfulness: Acting with awareness, Nonjudging of inner experience, Nonreactivity to inner experience, Observing, and Describing.

A multiple regression analysis using a stepwise selection procedure was conducted to examine the relationship between one's level of awareness, 'acting with awareness', 'nonjudging of inner experience', 'nonreactivity to inner experience', 'observing', and 'describing', and alcohol misuse as measured by the IAI. Results show that the facets 'acting with awareness' and 'nonreactivity to inner experience' accounted for 19% of the variance in overall alcohol misuse, $F(2,102) = 11.99$, $p < .000$. The facet 'acting with awareness' accounted for most of the variance (10%), $p < .001$. The facet 'nonreactivity to inner experience' accounted for the remaining variance (6%), $p < .008$. A summary of the multiple regression analysis is found in Table 3 below.

Table 1

Mean and Standard Deviations of Scores on the Five Facet Mindfulness Questionnaire, the Index of Alcohol Involvement, and the Alcohol Use Disorder Identification Test

Variable	Mean and Standard Deviation	Possible Range of Scores
Observing	$M = 3.30$ $SD = .63$	1 – 5
Describing	$M = 3.58$ $SD = .73$	1 – 5
Acting with awareness	$M = 3.27$ $SD = .71$	1 – 5
Nonjudging of inner experience	$M = 3.51$ $SD = .65$	1 – 5
Nonreactivity to inner experience	$M = 3.01$ $SD = .60$	1 – 5
AUDIT	$M = 8.42$ $SD = 6.34$	0 – 40
IAI	$M = 1.85$ $SD = 0.63$	1 – 7

Table 2

Summary of the Stepwise Regression Analysis for the Five Facets of Mindfulness Predicting Alcohol Misuse as Measured by the AUDIT (N = 105)

Predictor	*B*	*SE B*	*β*
Observing	-2.54	.95	-.25 **
Acting with awareness	-1.87	.83	-.21*

Note. $R^2 = .13$ ($p < .05$).

* $p < .05$

** $p < .01$

Table 3

Summary of the Stepwise Regression Analysis for the Five Facets of Mindfulness Predicting Alcohol Misuse as measured by the IAI (N = 105)

Predictor	*B*	*SE B*	*β*
Acting with awareness	-.27	.08	-.31 **
Nonreactivity to inner experience	-.26	.10	-.25 **

Note. $R^2 = .19$ ($p < .05$).

** $p < .01$

Discussion

The current study examined the relationship between one's level of mindfulness and one's resistance to alcohol-related disorders. More specifically, the study attempted to find out which of the five facets of mindfulness, as identified by Baer and colleagues (2006), i.e., 'nonreactivity to inner experience', 'nonjudging of inner experience', 'observing', 'describing', 'acting with awareness', would be most predictive of resistance to alcohol-related disorders. It was hypothesized that four of the five facets, 'acting with awareness', 'nonreactivity to inner experience', 'nonjudging of inner experience', and 'observing', would be predictive while 'describing' would not. In addition, the study anticipated that the facet 'nonreactivity to inner experience' would account for the most variance, followed by 'acting with awareness', 'observing', and 'nonjudging of inner experience'.

Study results showed that the participants' scores on each of the five facets of the FFMQ fell within the average range. In other words, the participants tended to go through their daily lives in a relatively mindful manner. While they were not mindless, they were not as mindful as skilled meditators are. Scores on the IAI indicated few to no alcohol problems but the participants' scores on the AUDIT indicated that they met the threshold for alcohol misuse. These differences in outcomes were explained in the results section of this thesis.

Mindfulness as a Predictor of Resistance to Alcohol-Related Disorders

The first multiple regression analysis on the AUDIT scores indicated that the facets of 'observing' and 'acting with awareness' accounted for 13% of the variance in whether one would misuse alcohol, whereas the analysis of the IAI scores showed that the facets of

'acting with awareness' and 'nonreactivity to inner experience' explained 19% of the variance. In other words, only less than 20% of the variance in alcohol misuse is explained by the three facets of mindfulness. However, a statistically significant R^2 of 14% is a strong effect size. Thus, while other factors besides mindfulness may be at play when predicting alcohol misuse (accounting for the remaining 80% or so of the variance), mindfulness is a critical and strong predictor.

The results of the study partially supported the hypotheses offered. With respect to the first hypothesis, only three of the four facets thought to be predictive of alcohol misuse appeared to be statistically significant factors in the two multiple regression analyses conducted: 'observing', 'acting with awareness', and 'nonreactivity to inner experience', but not 'nonjudging of inner experience'. However, as expected, 'describing' was not predictive of alcohol misuse. This does not mean that the latter two facets are not important in cultivating mindfulness itself. However, it may not be necessary in successfully reducing one's level of vulnerability to alcohol-related disorders.

Upon examining the relative importance of the various facets 'nonreactivity to inner experience' did not account for most of the variance as earlier expected. In fact, this facet was predictive in one multiple regression model but not in the other. Instead, the facet of 'acting with awareness' proved to be the most consistent predictor by appearing in both multiple regression models that were generated. Among the various facets of mindfulness, 'acting with awareness' would appear to serve as the best foundation of building resistance to alcohol-related disorders.

Why is noticing or attending to one's sensations, perceptions, thoughts, and feelings and refraining from holding on to pleasant or avoiding unpleasant experiences or

emotions (i.e., 'observing') important? Two perspectives on addiction, object relations and existential humanistic theories, offer us explanations. They focus on the addict's inability to successfully handle distressing experiences and view addiction as an attempt to prolong pleasant experiences while consciously avoiding unpleasant ones. In object relations theory, the addict constructs a view of him/herself and others based upon the internalization of relationships from a primary caregiver. When needs are not successfully met by these relationships, attempts are made to replace these lost objects through the use of alcohol or drugs, thus allowing the individual to maintain a continuous state of pleasure while attempting to avoid unpleasant experiences in life. Similarly, the existential humanistic perspective views addiction as a coping mechanism. Alcohol/drugs provide temporary relief from those experiences deemed uncomfortable, ultimately leading to a physiological addiction. An individual who tends to be attached to pleasant experiences and avoidant of unpleasant ones (i.e., deficient in the mindfulness trait of 'observing') is more likely to use any means necessary to prolong the pleasurable experiences and to shun the painful ones.

What role does not reacting impulsively when faced with distressing experiences (i.e., 'nonreactivity to inner experience') play in predicting resistance to alcohol misuse? Whether the addict is aware or not, stimuli can become triggers, leading to use/relapse if the addict has a tendency to act impulsively and is unaware of his/her present moment experiences (Tiffany, 1990, as cited in Breslin et al., 2002). Support for this can be found in literature regarding the prefrontal cortex and activation of drug use memory networks. Changes to the prefrontal cortex, thought to be affected by alcohol and other drugs of abuse, "could lead to impairments in self-monitoring and behavior control, playing an

important role in the cognitive changes that perpetuate drug self-administration (Kaufman et al., 2003, as cited in Volkow et al., 2004, p. 8)." Additionally, impulsivity will play a role based upon activation of drug use memory networks. Baker and colleagues (1986) and Tiffany (1990) both focused on the role of activation of memory networks perpetuating drug and alcohol-related disorders. Their focus was on the role of attention to encoding information within our memories. Baker and colleagues (1986) noted that the "conditioned motivation is encoded in a memory network containing propositional information about drug-relevant and affective stimuli and responses to these stimuli" (as cited in Breslin et al., 2002, p. 284). For example, positive and negative reinforcement would influence the individual's use of alcohol/drugs as a way to improve mood or avoid withdrawal symptoms, and as discussed by Tiffany (1990) the triggers are "established by repetitive, stereotyped drug use and operate automatically, that is, with little conscious awareness or effort" (as cited in Breslin et al., 2002, p. 284).

Support for the importance of the 'acting with awareness' facet comes from literature regarding the psychological and physiological aspects of addiction. With regard to the physiological aspect, the literature has indicated that mindfulness increases activation in the left prefrontal cortex, which is in turn associated with increased positive affect. Furthermore, Cooney and colleagues (1997) have demonstrated the effect mood states have upon one's desire to drink. In addition, Davidson and colleagues (2003) discovered a positive relationship between left-sided activation of the brain and a rise in antibody titers among those in a meditation group compared to those who did not meditate. Thus, mindfulness may aid in overall well-being, similar to the effect exercise has on the release of chemicals such as dopamine. Psychologically, raising one's level of awareness

and/or attention to the present moment will reduce the possibility of mindlessly engaging in maladaptive or repetitive behaviors that accompany alcohol-related disorders (Tiffany, 1990, as cited in Breslin et al., 2002).

While the facets of 'acting with awareness', 'observing', and 'nonreactivity to inner experiences' were found to be predictive of resistance to alcohol-related disorders, the facets of 'describing' and 'nonjudging of inner experience' were not. A review of current literature regarding substance and alcohol abuse/dependence indicates little to no support for the facet 'describing' as playing a role in preventing addiction. However, there has been support for the facet 'nonjudging of inner experience'; those who are judgmental towards their experiences, either internal or external, would be more susceptible to emotional issues which may lead to alcohol misuse as a coping mechanism (Breslin et al., 2002). Although there seems to be a relationship between how critical one is with one's experiences and alcohol misuse, the relationship might not be a direct one and may be contingent on whether or not one succumbs to emotional problems. This may explain why the facet was not found to be predictive in this study. On the other hand, research literature on the facets of 'acting with awareness', 'observing', and 'nonreactivity to inner experiences' point to a more direct link with addiction.

Developing Therapies for Alcohol-Related Disorders Using Mindfulness

Given the study findings, it is important for intervention/prevention programs to focus on the development of awareness to the present moment. Several therapies already utilize mindfulness as a foundation for their program, or draw from specific techniques of mindfulness. For example, because MBSR and MBCT center their programs on mindfulness, all five facets are being cultivated within participants, whereas ACT and

DBT cultivate only the facets of 'nonreactivity to inner experience', 'observing', and 'nonjudging of inner experience'. Based upon our findings one would assume MBSR and MBCT may be better suited for those who are experiencing alcohol-related issues, though ACT and DBT may be effective because they cultivate the facet 'observing', raising the individual's awareness to their experiences whether they are believed to be pleasant or not.

Among those programs specifically designed for alcohol-related disorders, only three of the previously mentioned programs have goals which parallel the facet 'acting with awareness'. These include Brief Intervention (BI) and Brief Motivational Intervention (BMI). Motivational Enhancement Therapy (MET) is included because BMI is integrated into it. On the other hand, five programs incorporate the facet 'observing', that of Cognitive Behavioral Coping Skills (CBST), Alcohol Behavioral Couples Therapy (ABCT), Relapse Prevention (RP), and Motivational Interviewing (MI). Motivational Enhancement Therapy (MET) is also included in this set because it includes MI.

For those who are interested in developing mindfulness prevention/intervention programs for alcohol-related disorders the results of this study imply that programs should initially focus on developing 'acting with awareness' (i.e., not acting on automatic pilot). Once this facet has been cultivated the remaining facets may then be addressed depending upon the individual needs of the client. For example, individuals with a comorbid issue, which is the presence of two or more mental health issues occurring at the same time, may benefit from developing other facets in conjunction with 'acting with awareness' and/or 'observing'. From a cognitive behavioral perspective one who is suffering from an alcohol-related disorder and a mood disorder, such as Major Depressive Disorder, would first cultivate the facet 'acting with awareness' and then begin to cultivate the facet

'nonjudging of inner experience' as a way to prevent such individuals from judging their experiences too harshly which may lead to future depressive episodes. For those programs limited by time constraints and/or financial barriers, raising one's level of awareness to reduce vulnerability to alcohol-related disorders and relapse may be the only option.

Study Limitations and Future Studies

Although the results of this study demonstrate a strong and significant relationship between mindfulness and resistance to alcohol-related disorders, readers should be cognizant of the fact this study was purely correlational. Those who are more mindful tend to exhibit fewer symptoms of alcohol-related disorders. The study does not test, however, whether mindfulness leads to protection from alcohol misuse. It is just as possible that being free from alcohol addiction allows one to be more mindful. To test the causal nature of the relationship would require comparing an experimental group trained to be mindful with a control group. This would provide us with a confirmation of mindfulness as an intervention or as a preventative measure.

The study also only examined the relative importance of the various facets of mindfulness. 'Acting with awareness' was a consistent and strong predictor in the two multiple regressions that were conducted. This suggests that the facet may be the most critical element of mindfulness. Future studies, however, should examine whether this facet is a necessary condition when developing mindfulness. Does one need to learn how to act in a non-automatic fashion ('acting with awareness') first before learning how to not be critical of oneself ('nonjudging of inner experience')? Which factors ought to be developed first?

Due to time constraints a small number of participants were collected. Future researchers replicating the study should gather additional participants to establish generalizability. Second, it would be beneficial to examine the relationship between mindfulness and resistance from alcohol misuse with various age ranges. As previously mentioned, lability of affect is present among those in their late teens and early twenties, impacting higher order cognitive processing and decision-making as the prefrontal cortex develops. Next, it would also be beneficial to examine participants who are diagnosed with a current alcohol-related disorder. Based upon the results of this study we would hypothesize that these individuals would score lower on the facets 'acting with awareness', 'observing', and 'nonreactivity to inner experience' compared to those who exhibit no alcohol misuse symptoms. Such a comparative study would further support the results of the current study as well. Lastly, utilizing other mindfulness questionnaires measuring the same five facets identified by Baer and colleagues will further establish the validity of the study.

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Appendix A

Demographic Information

Please provide a response to each of the following questions.

1. Age: _____

2. Gender: Male or Female

3. Ethnicity:

   _____ White/Caucasian

   _____ Black/African-American

   _____ Hispanic

   _____ Native American

   _____ Asian American

   _____ Hawaiian or Pacific Islander

   _____ Other

4. Year in School

   _____ Freshman

   _____ Sophomore

   _____ Junior

   _____ Senior

   _____ Graduate

5. Academic Major _____

Appendix B

Five Facet Mindfulness Questionnaire

Instructions:

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.

_____ 2. I'm good at finding words to describe my feelings.

_____ 3. I criticize myself for having irrational or inappropriate emotions.

_____ 4. I perceive my feelings and emotions without having to react to them.

_____ 5. When I do things, my mind wanders off and I'm easily distracted.

_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.

_____ 7. I can easily put my beliefs, opinions, and expectations into words.

_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

_____ 9. I watch my feelings without getting lost in them.

_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.

_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

_____ 12. It's hard for me to find the words to describe what I'm thinking.

_____ 13. I am easily distracted.

_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.

_____ 16. I have trouble thinking of the right words to express how I feel about things.

_____ 17. I make judgments about whether my thoughts are good or bad.

_____ 18. I find it difficult to stay focused on what's happening in the present.

_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.

_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

_____ 21. In difficult situations, I can pause without immediately reacting.

_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.

_____ 24. When I have distressing thoughts or images, I feel calm soon after.

_____ 25. I tell myself that I shouldn't' be thinking the way I'm thinking.

_____ 26. I notice the smells and aromas of things.

_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____ 28. I rush through activities without being really attentive to them.

_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____ 32. May natural tendency is to put my experiences into words.

_____ 33. When I have distressing thoughts or images, I just notice them and let them go.

_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.

_____ 35. When I have distress thoughts or images, I judge myself as good or bad, depending what the thought/image is about.

_____ 36. I pay attention to how my emotions affect my thoughts and behavior.

_____ 37. I can usually describe how I feel at the moment in considerable detail.

_____ 38. I find myself doing things without paying attention.

_____ 39. I disapprove of myself when I have irrational ideas.

Appendix C

Index of Alcohol Involvement

This questionnaire is designed to measure your use of alcohol. It is not a test, so there is no right or wrong answers. Answer each item as carefully and as accurately as you can by placing a number beside each one as follows:

1 = Never

2 = Very rarely

3 = A little of the time

4 = Some of the time

5 = A good part of the time

6 = Most of the time

7 = Always

Please begin.

_____ 1. When I have a drink with friends, I usually drink more than they do.

_____ 2. My family or friends tell me I drink too much.

_____ 3. I feel that I drink too much alcohol.

_____ 4. After I've had one or two drinks, it is difficult for me to stop drinking.

_____ 5. When I am drinking, I have three or fewer drinks.

_____ 6. I feel guilty about what happened when I have been drinking.

_____ 7. When I go drinking, I get into fights.

_____ 8. My drinking causes problems with my family or friends.

_____ 9. My drinking causes problems with my work.

_____ 10. After I have been drinking, I cannot remember thing that happened when I think about them the next day.

_____ 11. After I have been drinking, I get the shakes.

_____ 12. My friends think I have drinking problem.

_____ 13. I drink to calm my nerves or make me feel better.

_____ 14. I drink when I am alone.

_____ 15. I drink until I go to sleep or pass out.

_____ 16. My drinking interferes with obligations to my family or friends.

_____ 17. I have one or more drinks when things are not going well for me.

_____ 18. It is hard for me to stop drinking when I want to.

_____ 19. I have one or more drinks before noon.

_____ 20. My friends think my level of drinking is acceptable.

_____ 21. I get mean and angry when I drink.

_____ 22. My friends avoid me when I am drinking.

_____ 23. I avoid drinking to access.

_____ 24. My personal life gets very troublesome when I drink.

_____ 25. I drink 3 to 4 times a week.

Appendix D

Alcohol Use Disorder Identification Test

Because alcohol use can affect your health and can interfere with certain medications and treatments, it is important that we ask some questions about your use of alcohol. Your answers will remain confidential so please be honest.

Please circle the response below each question that best describes your answer.

1. How often do you have a drink containing alcohol?

Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

1 or 2	3 or 4	5 or 6	7 to 9	10 or more

3. How often do you have six or more drinks on one occasion?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily

4. How often during the last year have you found that you were not able to stop drinking once you had started?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily

5. How often during the last year have you failed to do what was normally expected of you because of drinking?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because of you drinking?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily

9. Have you or someone else been injured because of your drinking?

No	Yes, but not in the last year	Yes, during the last year

10. Has a relative, friend, doctor, or other health care worker been concerned about you drinking or suggested you cut down?

No	Yes, but not in the last year	Yes, during the last year